Academic CV – Dennis van der Meer

Updated November 20, 2022

Email: denniswillemvandermeer@gmail.com
Phone: +33 7 66 42 82 84
GitHub
LinkedIn
Google Scholar
ORCID

Research interests

Probabilistic forecasting, online optimization, grid integration, renewable energy sources.

Education

Uppsala University — Uppsala, Sweden
Ph.D. in Engineering Science — 2021
Supervisors: Joakim Widén, Joakim Munkhammar.

Technical University Delft — Delft, Netherlands
MSc in Sustainable Energy Technology — 2016
Supervisors: Pavol Bauer, Gautham Ram Chandra Mouli.

Technical University Delft — Delft, Netherlands
BSc in Mechanical Engineering — 2013

Employment

MINES Paris – PSL University — Sophia Antipolis, France
Postdoctoral Fellow — 2021 – present

Uppsala University — Uppsala, Sweden
Researcher — 2021 – 2021

Uppsala University — Uppsala, Sweden
Ph.D. Fellow — 2016 – 2021

Honors and scholarships

Master thesis prize, 2nd place (QPark) — 2017
Finalist in Best Student Paper Award Competition (IEEE PVSC) — 2018
Best Paper Award (IEEE Industrial Electronics Society) — 2019

Impact and citations

Scopus: ∼830 (h-index = 13)
ResearchGate: ∼1070 (h-index = 13)
Google Scholar: ∼1140 (h-index = 14)

Teaching experience

Student supervisor and lecturer — 2016 – 2021
Solar Energy - Technology and Systems
Uppsala University

Student supervisor — 2017 – 2021
Project in Infrastructure Systems
Uppsala University

Student supervisor and lecturer — 2020
Analysis of Power Distribution Grids
Uppsala University

Student supervisor — 2021
Final Project in Renewable Energy Forecasting
MINES Paris

Invited lecturer 2022
The Energy Market and Energy Trading
City, University London

Research experience and funding

Development and evaluation of forecasting models for solar power and electricity use over space and time
Coordinators: J. Widén, J. Munkhammar (Uppsala University) 2016 – 2021
Funding agency: Energimyndigheten (4 055 173 SEK).
The project developed probabilistic forecasting methods for solar power and electricity use over space and time. Summary of findings available here. Apart from the literature review, I was not involved in writing the grant application.

Probabilistic forecasting for battery management
Coordinator: P. Ollas (Research Institutes of Sweden) 2018 – 2021
Funding agency: Energimyndigheten (3 999 074 SEK).
The project aimed at studying how battery management can benefit from probabilistic forecasts. Summary of findings available here (Swedish). I was involved in writing the proposal.

Center for Energy Research
Supervisor: J. Kleissl (UCSD) Feb. 2019 – May 2019
Funding agency: Anna Maria Lundins travel stipend (36 000 SEK).
During the research visit in the lab of renowned researcher Jan Kleissl, a probabilistic optimization model for reactive power control of smart inverters was developed.

Smart4RES: Data science for renewable energy prediction
Coordinators: G. Kariniotakis, S. Camal (MINES Paris) 2019 – present
Funding agency: European Horizon 2020 (€3 999 915).
The project aims to develop and validate the next generation tools that jointly enable (i) an increase of at least 15% in RES forecasting performance, and (ii) leverage the economic value of RES forecasting by considering the whole value chain. I was not involved in writing the grant proposal.

Flexibility and energy efficiency in buildings with solar energy and vehicle charging
Coordinator: P. Ollas (Research Institutes of Sweden) 2020 – present
Funding agency: Energimyndigheten (4 145 058 SEK).
The overall aim of the project is to quantify the potential for increased utilization of solar energy by reducing the losses of energy in buildings and exploiting their flexibility. I was involved in writing the grant proposal.

Industry experience

Greenlytics Stockholm, Sweden
External consultant 2019 – 2021
The aim was to investigate the potential of satellite imagery to enhance photovoltaic power production forecasts at high latitudes.

Journal publications

Probabilistic forecasting of solar power, electricity consumption and net load: Investigating the effect of seasons, aggregation and penetration on prediction intervals
Dennis van der Meer, Joakim Munkhammar, Joakim Widén.
Solar Energy, Vol. 171: pp. 397-413 (2018).

Residential probabilistic load forecasting: A method using Gaussian process designed for electric load data
Mahmoud Shepero, **Dennis van der Meer**, Joakim Munkhammar, Joakim Widén.
Applied Energy, Vol. 218: pp. 159-172 (2018).

Probabilistic forecasting of electricity consumption, photovoltaic power generation and net demand of an individual building using Gaussian Processes
Dennis van der Meer, Mahmoud Shepero, Andreas Svensson, Joakim Widén, Joakim Munkhammar.
Applied Energy, Vol. 213: pp. 195-207 (2018).

Review on probabilistic forecasting of photovoltaic power production and electricity consumption
Dennis van der Meer, Joakim Widén, Joakim Munkhammar.
Renewable and Sustainable Energy Reviews, Vol. 81: pp. 1484-1512 (2018).

Energy Management System With PV Power Forecast to Optimally Charge EVs at the Workplace
Dennis van der Meer, Gautham Ram Chandra Mouli, Germán Morales-España, Laura Ramirez Elizondo, Pavol Bauer.
IEEE Transactions on Industrial Informatics, Vol. 14: pp. 311-320 (2018).

An alternative optimal strategy for stochastic model predictive control of a residential battery energy management system with solar photovoltaic
Dennis van der Meer, Guang Chao Wang, Joakim Munkhammar.
Applied Energy, Vol. 283: 116289 (2020).

Very short term load forecasting of residential electricity consumption using the Markov-chain mixture distribution (MCM) model
Joakim Munkhammar, **Dennis van der Meer**, Dazhi Yang.
Applied Energy, Vol. 282 (A): 116180 (2020).

Smart charging of electric vehicles considering photovoltaic power production and electricity consumption: a review
Reza Fachrizal, Mahmoud Shepero, **Dennis van der Meer**, Joakim Munkhammar, Joakim Widén.
eTransportation, Vol. 4: 100056 (2020).

Probabilistic solar forecasting benchmarks on a standardized dataset at Folsom, California
Dazhi Yang, **Dennis van der Meer**, Joakim Munkhammar.

Solar Energy, Vol. 206: pp. 628-639 (2020).

Probabilistic forecasting of high-resolution clear-sky index time-series using a Markov-chain mixture distribution model
Joakim Munkhammar, **Dennis van der Meer**, Joakim Widén.
Solar Energy, Vol. 184: pp. 688-695 (2020).

Verification of deterministic solar forecasts
Dazhi Yang, Stefano Alessandrini, Javier Antonanzas, Fernando Antonanzas-Torres, Viorel Badescu, Hans G. Beyer, Robert Blaga, John Boland, Jamie M. Bright, Carlos F. M. Coimbra, Mathieu David, Âzedinne Frimane, Christian A. Gueymard, Tao Hong, Merlinde J. Kay, Sven Killinger, Jan Kleissl, Philippe Lauret, Elke Lorenz, **Dennis van der Meer**, Marius Paulescu, Richard Perez, Oscar Perpiñán-Lamigueiro, Ian M. Peters, Gordon Reikard, Dave Renné, Yves-Marie Saint-Drenan, Yong Shuai, Ruben Urraca, Hadrien Verbois, Frank Vignola, Cyril Voyant, Jie Zhang.
Solar Energy, Vol. 210: pp. 20-37 (2020).

Clear-sky index space-time trajectories from probabilistic solar forecasts: Comparing promising copulas
Dennis van der Meer, Dazhi Yang, Joakim Munkhammar, Joakim Widén.
Journal of Renewable and Sustainable Energy, Vol. 12: 026102 (2020).

A benchmark for multivariate probabilistic solar irradiance forecasts
Dennis van der Meer.
Solar Energy, Vol. 225: pp. 286-296 (2021).

Post-processing in solar forecasting: Ten overarching thinking tools
Dazhi Yang, **Dennis van der Meer**.
Renewable and Sustainable Energy Reviews, Vol. 140: 110735 (2021).

Infinite hidden Markov model for short-term solar irradiance forecasting
Âzeddine Frimane, Joakim Munkhammar, **Dennis van der Meer**.
Solar Energy, Vol. 244: pp. 331-342 (2022).

A review of solar forecasting, its dependence on atmospheric sciences and implications for grid integration: Towards carbon neutrality
Dazhi Yang, Wenting Wang, Christian A. Gueymard, Tao Hong, Jan Kleissl, Jing Huang, Marc J. Perez, Richard Perez, Jamie M. Bright, Xiang'ao Xia, **Dennis van der Meer**, Ian Marius Peters.
Renewable and Sustainable Energy Reviews, Vol. 161: 112348 (2022).

Progress in regional PV power forecasting: A sensitivity analysis on the Italian case study
Marco Pierro, Damiano Gentili, Fabio Romano Liolli, Cristina Cornaro, David Moser, Alessandro Betti, Michela Moschella, Elena Collino, Dario Ronzio, **Dennis van der Meer**.

Renewable Energy, Vol. 189: pp. 983-996 (2022).

Conference publications

A comparison of strategies for net demand forecasting in case of photovoltaic power production and electricity consumption
Dennis van der Meer, Joakim Widén, Joakim Munkhammar.
Proceedings of the 34th European Photovoltaic Solar Energy Conference, Amsterdam, The Netherlands, September 25-29 (2017).

Investigating the effect of aggregation on prediction intervals in case of solar power, electricity consumption and net demand forecasting
Dennis van der Meer, Joakim Widén, Joakim Munkhammar.
Proceedings of the 7th Solar Integration Workshop, Berlin, Germany, October 24-25 (2017).

Predicting hosting capacity of photovoltaic power production in low-voltage grids using regressive techniques
Dennis van der Meer, Jonas Andersson, Vendela Bernström, Joakim Törnqvist, Joakim Widén.
Proceedings of the 7th Solar Integration Workshop, Berlin, Germany, October 24-25 (2017).

Probabilistic clear-sky index forecasts using Gaussian process ensembles
Dennis van der Meer, Joakim Munkhammar, Joakim Widén.
Proceedings of the 2018 World Conference on Photovoltaic Energy Conversion, Waikoloa, Hawaii, June 9-15 (2018).

Probabilistic forecasting of the clear-sky index using Markov-chain mixture distribution and copula models
Joakim Munkhammar, **Dennis van der Meer**, Joakim Widén.
Proceedings of the 2019 IEEE Photovoltaic Specialist Conference, Chicago, Illinois, June 16-21 (2019).

Direct forecast of solar irradiance for EV smart charging scheme to improve PV self-consumption at home
Reza Fachrizal, **Dennis van der Meer**, Joakim Munkhammar.
2021 IEEE PES Innovative Smart Grid Technologies Europe (ISGT Europe) (2021).

Seamless intra-day and day-ahead multivariate probabilistic forecasts at high temporal resolution
Dennis van der Meer, Simon Camal, Georges Kariniotakis.
2022 17th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS) (2022).

Data-Enabled Reactive Power Control of Distributed Energy Resources via a Copula Estimation of Distribution Algorithm
Dennis van der Meer, Hamed Haghi, Jan Kleissl, Joakim Widén.
2022 17th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS) (2022).

Generalizing renewable energy forecasting using automatic feature selection and combination

Dennis van der Meer, Simon Camal, Georges Kariniotakis.
2022 17th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS) (2022).

End-to-end Learning for Hierarchical Forecasting of Renewable Energy Production with Missing Values
Akylas Stratigakos, **Dennis van der Meer**, Simon Camal, Georges Kariniotakis.
2022 17th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS) (2022).

Submitted & working papers

Day-ahead probabilistic forecasting at a co-located wind and solar power park in Sweden: Trading and forecast verification
Oskar Lindberg, David Lingfors, Johan Arnqvist, **Dennis van der Meer**, Joakim Munkhammar.
Submitted to Advances in Applied Energy (2022).

Nonlinear online probabilistic forecast combination
Dennis van der Meer, Pierre Pinson, Simon Camal, Georges Kariniotakis.
In manuscript (2022).

Seamless intra-day and day-ahead multivariate probabilistic forecasts
Dennis van der Meer, Simon Camal, Georges Kariniotakis.
In manuscript (2022).

Academic citizenship

Reviewer tasks 2018 – present
I have reviewed numerous manuscripts from prominent journals such as the International Journal of Forecasting, Solar Energy, Renewable and Sustainable Energy Reviews, Journal of Renewable and Sustainable Energy, IEEE Transactions on Industrial Informatics, Renewable Energy, Applied Energy, etc.

Board member at Civil and Industrial Engineering (Uppsala University) 2020 – 2021
In this committee we discussed and decided, e.g., if new positions should be made vacant, whether teaching should be expanded and budget related issues.

Talks and tutorials

Seamless intra-day and day-ahead multivariate probabilistic forecasts at high temporal resolution March 2022
International Energy Agency PVPS Task 16 Expert Meeting.

Space-time trajectories from probabilistic forecasts August 2020
International Solar Energy Society webinar.

Clear-sky index space-time trajectories from probabilistic forecasts: Comparing promising copulas March 2020
International Energy Agency PVPS Task 16 Expert Meeting.

Skills

Programming
Proficient in: R, Python.
Familiar with: Matlab, Julia.

Languages
Dutch, English (fluent), Swedish (advanced), French (beginner).

Professional memberships

IEEE Student Member Sept. 2016 – Present
Graduate student assistant at IEEE PVSC 45.

References

Pierre Pinson, Chair of Data-centric Design Engineering
Dyson School of Design Engineering
Imperial College London
South Kensington campus
London SW7 2DB, UK
Tel: +44 (0)20 7594 6200
p.pinson@imperial.ac.uk

Joakim Widén, Professor and Head of Division
Division of Civil Engineering and Built Environment
Uppsala University
P.O. Box 534
SE-751 21 Uppsala, SE
Tel: +46 18 471 37 82
joakim.widen@angstrom.uu.se

Dazhi Yang, Professor
Department of Electrical Engineering and Automation
Harbin Institute of Technology
92 West Dazhi Street
Heilongjiang, CN
Tel: +86 0451-86418297
yangdazhi.nus@gmail.com